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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,399	05/24/2001	Sung Woong Moon	8733.440.00	9194

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EXAMINER

DI GRAZIO, JEANNE A

ART UNIT PAPER NUMBER

2871

DATE MAILED: 05/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Applicati n No.	Applicant(s)	
	09/863,399	MOON ET AL.	
	Examiner	Art Unit	
	Jeanne A. Di Grazio	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,7,10-17 and 20-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7,10-17 and 20-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims

Claims 1, 3, 4, 7, 10-12 and 17 are amended per Applicant's Amendment of February 4, 2004. Claims 1, 7, 11, 12, and 17 are independent claims. Claims 2, 5-6, 8-9 and 18-19 are cancelled per Applicant's Amendment of February 4, 2004. Claims 1, 3-4, 7, 10-17 and 20-26 are pending.

Priority

Priority to Korean Patent Application No. 2000-28072 (May 24, 2000) is claimed.

Claim Objections

Claim 11 is objected to because of the following informalities. As to claim 12, the recitation "a printed circuit board mounted with circuits generating driving signals for driving the liquid crystal display panel" lacks antecedent basis as not having been properly introduced into the body of the claim. Appropriate correction is required.

Claim 12 is objected to because of the following informalities. As to claim 12, the recitation "a printed circuit board mounted with circuits generating driving signals for driving the liquid crystal display panel" lacks antecedent basis as not having been properly introduced into the body of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3-4, 7, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (US 6,050,830) in view of Kwon et al. (US 6,319,019 B1).

As to claim 1 (amended): Tanaka discloses (Figures 1-5) a pad part (2) being provided with a plurality of pads bonded to pads of an LCD panel and the pad part is (2) divided into at least two parts (notched section, 6) with an opening between the two parts (6).

Tanaka does not appear to explicitly specify a printed circuit board mounted with circuits generating driving signals for driving the liquid crystal display panel; wherein said tape carrier

package is bonded in a bent state between the liquid crystal display panel and the printed circuit board.

Kwon teaches and discloses a selectively reinforced flexible tape carrier package for liquid crystal display modules (Title, entire patent). With reference to Figure 5, by way of non-limiting example, a tape carrier package (100) that is bonded (Column 3, Lines 44-49, "a flexible tape carrier package 100 that connects the LCD panel 140 to the PCB 150.") in a bent state between an LCD panel (140) and a printed circuit board (150). Kwon teaches and discloses that "[f]lexible tape carrier packages according to the invention may be combined with an LCD panel and a microelectronic substrate such as a printed circuit board to provide improved LCD modules. The LCD modules can reduce damage in the conductive leads of the flexible tape carrier package when the printed circuit board is suspended from the LCD panel by the tape carrier package. Improved reliability and/or yield and/or performance may thereby be obtained." (Column 3, Lines 1-8).

Kwon is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to bond a tape carrier package in a bent state between a liquid crystal display panel and printed circuit board for improved reliability and/or yield and/or performance.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Tanaka in view of Kwon for improved reliability and/or yield and/or performance.

As to claim 3 (amended), an integrated circuit is mounted across the opening and the opening is formed by removing one side of a base film provided with the pad part (Tanaka, Figure 1, IC 11).

As to claim 4 (amended), the opening is positioned at the center of the upper portion of the base film opposed to the pads of the liquid crystal display panel (Tanaka, Figures 1-5).

As to claim 7 (amended), Tanaka has a pad part (2) being provided with a first plurality of pads bonded to pads of the LCD and the pad part is divided into at least two parts (Figures 1-5) with an opening (6) between the two parts, TCP bonded onto the substrate (Cols. 2-6) provided with pads connected to circuits generating driving signals to drive the liquid crystal display panel.

Tanaka does not appear to explicitly specify a tape carrier package is bonded in a bent state between the liquid crystal display panel and the substrate.

Kwon teaches and discloses a selectively reinforced flexible tape carrier package for liquid crystal display modules (Title, entire patent). With-reference to Figure 5, by way of non-limiting example, a tape carrier package (100) that is bonded (Column 3, Lines 44-49, "a flexible tape carrier package 100 that connects the LCD panel 140 to the PCB 150.") in a bent state between an LCD panel (140) and a printed circuit board (150). Kwon teaches and discloses that "[f]lexible tape carrier packages according to the invention may be combined with an LCD panel and a microelectronic substrate such as a printed circuit board to provide improved LCD modules. The LCD modules can reduce damage in the conductive leads of the flexible tape carrier package when the printed circuit board is suspended from the LCD panel by the tape

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carrier package. Improved reliability and/or yield and/or performance may thereby be obtained.”
(Column 3, Lines 1-8).

Kwon is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to bond a tape carrier package in a bent state between a liquid crystal display panel and a substrate for improved reliability and/or yield and/or performance.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Tanaka in view of Kwon for improved reliability and/or yield and/or performance.

As to claim 11 (amended), Applicant's recited method steps would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made in light of the structures as disclosed and taught by Tanaka in view of Kwon.

Claim 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 6,198, 519 B1) in view of Kwon et al. (US 6,319,019 B1).

As to claim 11 (amended), Chang clearly discloses a tape carrier package that is bonded to a liquid crystal display panel wherein the tape carrier package has a pad part (Figure 4, TCP panel 200, TCP out-lead bonding pads 40) bonded to pads of the liquid crystal display panel (Col. 3, Lines 6-15), and the pads are separated by a distance (Figure 4). The limitation “divided” is broadly taken to mean a distance between the pads. Divide means “to separate into two or

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more parts, areas, or groups.” (Merriam Webster’s Collegiate Dictionary, 10TH Ed.). In Chang, the pads are separated by a given width.

Steps of bonding a liquid crystal display panel wherein the tape carrier package has a pad part (Figure 4, TCP panel 200, TCP out-lead bonding pads 40) bonded to pads of the liquid crystal display panel (Col. 3, Lines 6-15), and the pads are separated by a distance (Figure 4) and dividing a pad part into at least two parts would have been obvious to one of ordinary skill in the art at the time the invention was made for testing and preventing misalignment (Col. 1, Lines 41-44).

Chang does not appear to explicitly specify bonding the tape carrier package in a bent state between the liquid crystal display and a printed circuit board mounted with circuits generating driving signals for driving the liquid crystal display panel.

Kwon teaches and discloses a selectively reinforced flexible tape carrier package for liquid crystal display modules (Title, entire patent). With reference to Figure 5, by way of non-limiting example, a tape carrier package (100) that is bonded (Column 3, Lines 44-49, “a flexible tape carrier package 100 that connects the LCD panel 140 to the PCB 150.”) in a bent state between an LCD panel (140) and a printed circuit board (150). Kwon teaches and discloses that “[f]lexible tape carrier packages according to the invention may be combined with an LCD panel and a microelectronic substrate such as a printed circuit board to provide improved LCD modules. The LCD modules can reduce damage in the conductive leads of the flexible tape carrier package when the printed circuit board is suspended from the LCD panel by the tape carrier package. Improved reliability and/or yield and/or performance may thereby be obtained.” (Column 3, Lines 1-8).

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Kwon is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to bond a tape carrier package in a bent state between a liquid crystal display panel and printed circuit board for improved reliability and/or yield and/or performance.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Chang in view of Kwon for improved reliability and/or yield and/or performance.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (US 6,050,830) in view of Kondo et al. (JP-10-170883).

As to claim 10, Tanaka does not appear to explicitly specify a backlight unit being installed under the substrate to irradiate a light onto the LCD panel.

Kondo teaches and discloses a backlight for use in ambient light (Abstract).

Kondo is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to incorporate a backlight so that the display device could be used in ambient light.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Tanaka in view of Kondo for an LCD panel that can be used in ambient light.

Claims 12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurokawa et al. (US 6,054,975) in view of Kwon et al. (US 6,319,019 B1).

As to claims 12 (amended), 14, and 15: Kurokawa Figure 4 discloses a tape carrier package (300) with a base film (305), a plurality of output pads (304b) on the base film, and a slit between two of the output pads. "Slit" as broadly interpreted means a long narrow cut or opening. (Merriam Webster's Collegiate Dictionary, 10TH Ed.). Therefore, a slit can be broadly read as an opening. Figure 4 shows an opening between output side bonding pads. The TCP furthermore includes an input pad (304a) and an IC chip (301).

Kurokawa does not appear to explicitly a tape carrier package is bonded in a bent state between a liquid crystal display panel and the printed circuit board mounted with circuits generating driving signals for driving the liquid crystal display panel.

Kwon teaches and discloses a selectively reinforced flexible tape carrier package for liquid crystal display modules (Title, entire patent). With reference to Figure 5, by way of non-limiting example, a tape carrier package (100) that is bonded (Column 3, Lines 44-49, "a flexible tape carrier package 100 that connects the LCD panel 140 to the PCB 150.") in a bent state between an LCD panel (140) and a printed circuit board (150). Kwon teaches and discloses that "[f]lexible tape carrier packages according to the invention may be combined with an LCD panel and a microelectronic substrate such as a printed circuit board to provide improved LCD modules. The LCD modules can reduce damage in the conductive leads of the flexible tape carrier package when the printed circuit board is suspended from the LCD panel by the tape

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carrier package. Improved reliability and/or yield and/or performance may thereby be obtained.”

(Column 3, Lines 1-8).

Kwon is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to bond a tape carrier package in a bent state between a liquid crystal display panel and printed circuit board for improved reliability and/or yield and/or performance.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Kurokawa in view of Kwon for improved reliability and/or yield and/or performance.

Claims 13 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Kurokawa et al. (US 6,054,975) in view of Kwon et al. (US 6,319,019 B1) in further view of Inada et al. (US 5,608,559).

As to claims 13 and 16: Kurokawa does not appear to explicitly specify that the base film is made of polyimide and is flexible.

Inada has a flexible base film of polyimide that is commonly used in the construction of wiring boards (Col. 8, Lines 21-33).

Inada is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to form a base film of flexible polyimide for the construction of wiring boards.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Kurokawa in view of Inada for a flexible polyimide base film used in the construction of wiring boards.

Claims 17 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurokawa et al. (US 6,054,975) in view of Sakamoto et al. (US 5,572,346) and further in view of Kwon et al. (US 6,319,019 B1).

As to claims 17 (amended)-25, Kurokawa (Figure 4) discloses a tape carrier package (300) with a base film (305), a plurality of output pads (304b) on the base film, and a slit between two of the output pads. "Slit" as broadly interpreted means a long narrow cut or opening. (Merriam Webster's Collegiate Dictionary, 10TH Ed.). Therefore, a slit can be broadly read as an opening. Figure 4 shows an opening between output side bonding pads. The TCP furthermore includes an input pad (304a) and an IC chip (301).

Kurokawa does not appear to explicitly specify a TCB input pad electrically connected to an output signal conductor of a PCB and output pads connected to conductive lines of a substrate; however, Sakamoto teaches:

[Related Art]: "A liquid crystal display (LCD) uses 9 TAB tape carrier as a means of connecting its printed circuit board to the electrodes on the glass board of its liquid crystal panel. An LCD driver chip is mounted on the TAB tape carrier. FIG. 1 shows a conventional TAB tape carrier 10 for an LCD driver package. FIG. 2 shows the state in which such a tape carrier is connected to a printed circuit board and the glass board of a liquid crystal panel. The TAB tape carrier 10 has an insulating film tape 11 formed of a polyimide layer, input lead conductors 12 laid on its surface, and output lead conductors 14.

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The TAB tape carrier 10 has a chip mounting opening 16, which provides a chip mounting site. The input leads 12 extend from the chip mounting opening 16 toward one edge of the tape and are terminated across a long slot 18 formed along this edge. The output leads 14 extend from the chip mounting opening 16 toward the other edge of the tape. On the side of the output leads 14, no opening is formed. An LCD driver chip 22 is connected to the input leads 12 and output leads 14 in the position of the chip mounting opening 16. In this manner, an LCD driver tape carrier package is formed.

When an LCD driver package is mounted on an LCD unit, the tape edge on the side of the input leads 12 is cut along line A-A (FIG. 1), so that the tips of the input leads 12 are exposed. The exposed tips of the input leads 12 are soldered to the corresponding conductors (not illustrated) of the printed circuit board 24 and the output leads 14 are connected to the corresponding panel electrodes of the LCD glass board 26. Since the output leads 14 are usually formed at a higher density than the input leads 12, they are liable to cause problems such as short-circuiting when connected, if the output leads 14 are not backed with the film tape. For this reason, the output leads 14 are connected to the glass board in a state of being supported on the insulating film tape 11. Since the glass board is flat, the output leads 14 can be connected even as they are attached to the insulating film tape 11. On the other hand, the conductors on the printed circuit board 24 are not necessarily of equal height and hence the input leads 12 are exposed so that they can adapt to such differences in height."

Sakamoto has these connections for a conventional means of connecting a TCP and PCB to a liquid crystal display panel. The connections are made with solder; however, an anisotropic conductive film can be used in place of the solder as a functional equivalent of the solder.

Sakamoto furthermore discloses that the film has anchor holes in the film for preventing twisting or wrinkling of the tape (film) due to thermal expansion (Col. 2, Lines 36-38).

Sakamoto is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to connect a tape carrier package, printed circuit

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board, and LCD panel in such a way to prevent wrinkling of a base film due to thermal expansion.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Kurokawa in view of Sakamoto for a conventionally connected tape carrier package, printed circuit board and LCD panel unit that prevents wrinkling of a base film due to thermal expansion.

Kurokawa does not appear to explicitly a tape carrier package is bonded in a bent state between a liquid crystal display panel and the printed circuit board mounted with circuits generating driving signals for driving the liquid crystal display panel.

Kwon teaches and discloses a selectively reinforced flexible tape carrier package for liquid crystal display modules (Title, entire patent). With reference to Figure 5, by way of non-limiting example, a tape carrier package (100) that is bonded (Column 3, Lines 44-49, "a flexible tape carrier package 100 that connects the LCD panel 140 to the PCB 150.") in a bent state between an LCD panel (140) and a printed circuit board (150). Kwon teaches and discloses that "[f]lexible tape carrier packages according to the invention may be combined with an LCD panel and a microelectronic substrate such as a printed circuit board to provide improved LCD modules. The LCD modules can reduce damage in the conductive leads of the flexible tape carrier package when the printed circuit board is suspended from the LCD panel by the tape carrier package. Improved reliability and/or yield and/or performance may thereby be obtained." (Column 3, Lines 1-8).

Kwon is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to bond a tape carrier package in a bent state between a

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liquid crystal display panel and printed circuit board for improved reliability and/or yield and/or performance.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Kurokawa in view of Kwon for improved reliability and/or yield and/or performance.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurokawa et al. (US 6,054,975) in view of Sakamoto et al. (US 5,572,346) in further view of Kwon et al. (US 6,319,019 B1) and further in view of Kondo et al. (JP-10-170883).

As to claim 26: Kurokawa does not appear to explicitly specify a backlight.

Kondo has a backlight for use in ambient light (Abstracts).

Kondo is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to incorporate a backlight so that the display device could be used in ambient light.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Kurokawa in view of Kondo for a backlight for use in ambient light.

Response to Arguments

Applicant's arguments with respect to claims 1, 7, 11, 12, and 17 have been considered but are moot in view of the new ground(s) of rejection. Applicant's ONLY issue of a tape carrier package bonded in a bent state between a liquid crystal display panel and a printed circuit board,

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has been addressed by the Examiner. Applicant is considered to have acquiesced to all other rejections made with respect to the dependent claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio

Patent Examiner
Art Unit 2871

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